

REMARKS

This is responsive to the Office Action mailed on September 29, 2003. With this Amendment, claims 2, 4, and 14 have been amended and claims 1, 19, 22 and 23 have been cancelled. The present application now contains claims 2-18, 20, 21, 24-29. Reconsideration and allowance of the claims as amended are respectfully requested.

While Applicant's records indicate a separate Abstract of the Disclosure was filed with the application, another copy accompanies this amendment as required by the Examiner.

Claims 1-7, 10-15, 18, 20, 21, 27 and 29 have been rejected as anticipated (Section 102) or obvious over (section 103) GB 2155756 and EP 0058463, and claims 1-7, 9, 10, 20, 21, 27 and 29 have been rejected as anticipated or obvious over Scheinberg, US 3,982,897 (Scheinberg). The present amendment amends claim 2 to be independent (and cancels claim 1) and makes obvious clerical corrections to claims 4 and 14. Reconsideration is respectfully solicited.

Applicant's amended claims recite that the active ingredient, comprising nitrogen-containing cycles or heterocycles, is at least 0.1% of the mass of the filter. For a filter having a mass of 200 mg, the quantity of nitrogen-containing cycles or heterocycles per cigarette must be at least 0.2 mg.

**1. GB 2155756**

GB 2155756 describes a filter composed of dry yeast, egg white and casein of cow's milk. The active ingredient is the yeast. Page 2, line 31. As shown in the following section 1(a), the filter of GB 2155756 contains no more than about 0.00066% nitrogen-containing cycles or heterocycles.

**1(a). GB 2155756 contains no more than about 0.00066% nitrogen-containing cycles or heterocycles.**

At page 2, lines 48-58, the filter composition is, for each 100 parts casein of cow's milk by weight

- 90 to 110 parts dry yeast by weight,
- 130 to 150 parts egg white by weight,

and other ingredients such as ammonia and caustic soda. Considering the highest concentration of dry yeast, a composition might comprise, for 100 parts casein of cow's milk

- 110 parts dry yeast, and
- 130 parts egg white.

Thus, a filter according to GB 2155756 containing the highest concentration of dry yeast contains 110 parts yeast to 340 parts by weight of the filter; slightly less than one-third yeast. If other ingredients are present as taught in GB 2155756, the concentration of yeast will not be that high.

The two other ingredients according to GB 2155756 (casein and egg white) are protein substances, i.e. comprising amino acids and not nucleotides. As amino acids, these substances contain at most trace amounts of nitrogen-containing heterocycles, and can be ignored for the present purposes.

For a filter having a mass of 200 mg, the quantity of dry yeast in the GB 2155756 filter is at most 66.7 mg.

Given that one yeast cell weighs approximately  $10^{-10}$  g, it can be deduced that 66.7 mg of yeast contains  $0.0667 \times 10^{10}$  cells. The mean mass of one DNA nucleotide is 306da, about  $5 \times 10^{-22}$  g.

The mean mass of one DNA base is 131da (Adenine = 134da, Cytosine = 111da, Guanine = 150da, Thymine = 127da). One deoxyribose weighs 131da. Phosphoric acid weighs 98da. The sum of the three masses (minus 3 water molecules weighing 54da) is equal to 306da. Therefore, the mean weight of one DNA nucleotide is 306da.

The mean mass of the nitrogen-containing heterocycles is 100da (purine = 120da and pyrimidine = 80da). Therefore, the mean mass ratio of nitrogen-containing heterocycle to nucleotide is  $100/306 \sim 0.333$ .

The DNA of one yeast cell contains approximately 12 million nucleotides. Therefore, the DNA mass contained in one yeast cell is equal to about  $6 \times 10^{-15}$  g. Therefore, the DNA mass contained in the  $0.0667 \times 10^{10}$  cells that form the 0.0667g of yeast is approximately  $0.0667 \times 10^{10} \times 6 \times 10^{-15}$  g =  $4 \times 10^{-6}$  g. Therefore, GB 2155756 discloses a filter containing not

more than  $4 \times 10^{-3}$  mg DNA.

Therefore, a 200 mg filter according to GB 2155756 contains no more than  $0.333 \times 4 \times 10^{-3}$  mg of nitrogen-containing heterocycles, i.e. not more than  $1.31 \times 10^{-3}$  mg of nitrogen-containing heterocycles. Therefore, the filter described in GB 2155756 contains not more than 0.00066% nitrogen-containing cycles or heterocycles.

**1(b). Applicant's claims are distinct from GB 2155756.**

A 200 mg filter described in GB 2155756 contains no more than about 0.0013 mg of nitrogen-containing heterocycles. As a result, nitrogen-containing cycles or heterocycles comprises about 0.00066% of the mass of the filter. Thus Applicant's filter contains more than 150 times the amount of nitrogen-containing cycles or heterocycles of the active ingredient than does the filter in GB 2155756.

Consequently, GB 2155756 does not explicitly nor inherently disclose the mass of the nitrogen-containing cycles or heterocycles being at least equal to or larger than 0.1% of the total mass of the filter as recited in claims 4, 18 and 29, nor adjusting the mass of the active ingredient [comprising molecules formed by one or more nitrogen-containing cycles or nitrogen-containing heterocycles] so that it is larger than or equal to 0.1% of the mass of the filter as recited in claim 2.

Regarding the rejection under Section 103, the Examiner gives no suggestion as to how the filter of GB 2155756 needs to be modified to meet the terms of Applicant's claims, or how such modifications might be obvious. It is Applicant's contention that the disclosure of the GB 2155756 patent does not make obvious Applicant's claimed invention and that the rejection should be withdrawn.

**2. Scheinberg**

Scheinberg discloses a filter member containing hemoglobin as an active ingredient. Hemoglobin is a porphyrine, which is an annular molecule wherein the center is a mineral (such as  $\text{Fe}^{++}$ ,  $\text{Cu}^{++}$ ) which carries out and determines the function of the ring. The molecule is not a nitrogen-containing cycle or heterocycle and is not arranged in chains of

molecules or bonded to fibers as recited in Applicant's claims. As disclosed, Scheinberg contemplates a vile or package of hemoglobin which, when broken, coats the fibers of the filter, but does not chemically bond to them. All of Applicant's claims recite that the active ingredient comprises a chain of molecules or molecules bound to fibers in a common chemical arrangement. The molecules are nitrogen-containing cycles or heterocycles.

Regarding the rejection under Section 103, the Examiner gives no suggestion as to how the filter of Scheinberg needs to be modified to meet the terms of Applicant's claims, or how such modifications might be obvious. It is Applicant's contention that the disclosure of the Scheinberg patent does not make obvious Applicant's claimed invention and that the rejection should be withdrawn.

### **3. EP 058,463.**

EP 058,463 discloses a filter member comprising an active dried yeast of not more than 0.5g of dry yeast per gram of tobacco (page 11, line 30).

A typical cigarette contains approximately 1g of tobacco. A filter constructed as described in EP 058,463 for a 1g cigarette contains no more than 500mg of dry yeast, which implies a filter weighing at least 500mg. As shown in the following section 2(a), the filter of EP 058,463 contains no more than about 0.002% nitrogen-containing cycles or heterocycles.

### **3(a) EP 058,463 contains no more than about 0.002% nitrogen-containing cycles or heterocycles.**

A filter is composed of 500mg of dry yeast. Given that one yeast cell weighs approximately  $10^{-10}$  g, it can be deduced that 500 mg of yeast contains  $0.5 \times 10^{10}$  DNA cells. From Section 1(a) above, the mean mass of one DNA nucleotide is about  $5 \times 10^{-22}$  g, and the DNA mass in one yeast cell is about  $6 \times 10^{-15}$  g. Therefore, the DNA mass contained in the  $0.5 \times 10^{10}$  cells that form the 0.500 g of yeast is approximately  $0.5 \times 10^{10} \times 6 \times 10^{-15} \text{ g} = 30 \times 10^{-6} \text{ g}$ . Therefore, EP 058463 discloses a filter containing not more than  $30 \times 10^{-3} \text{ mg}$  (0.03 mg) DNA. Since one-third of that mass is nitrogen-containing heterocycles, the 500 mg filter according to EP 058463 contains not more than 0.01 mg of nitrogen-containing heterocycles. Therefore, the 500 mg filter described in EP 058463 contains not more than 0.002% nitrogen-containing cycles or

heterocycles.

**3(b). Applicant's claims are distinct from EP 058,463.**

Since the filter is assumed to weigh 500 mg, the nitrogen-containing heterocycles make up approximately 0.002% of the filter. Therefore, applicant's filter contains about 50 times as much nitrogen-containing heterocycles EP 058463.

Consequently, EP 058463 does not explicitly nor inherently disclose the mass of the nitrogen-containing cycles or heterocycles being at least equal to or larger than 0.1% of the total mass of the filter as recited in claims 4, 18 and 29, nor adjusting the mass of the active ingredient [comprising molecules formed by one or more nitrogen-containing cycles or nitrogen-containing heterocycles] so that it is larger than or equal to 0.1% of the mass of the filter as recited in claim 2.

Regarding the rejection under Section 103, the Examiner gives no suggestion as to how the filter of EP 058463 needs to be modified to meet the terms of Applicant's claims, or how such modifications might be obvious. It is Applicant's contention that the disclosure of the EP 058463 patent does not make obvious Applicant's claimed invention and that the rejection should be withdrawn.

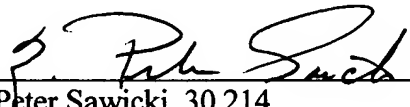
Should the Examiner repeat any rejection based on obviousness, it is respectfully requested that the reasons for such a finding be stated, and that Applicant be given the opportunity to respond to such reasons.

In view of the above, it is believed that all of the claims are now in allowable form. Reconsideration and allowance of all of the claims are respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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